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“Asteroseismic detection of planets and other companions to
intermediate-mass stars”

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The Kepler Space Telescope has revolutionised the fields of exoplanet detection and asteroseismology. With over 1000 confirmed planets and thousands more planet candidates, it is now the most successful planet-finding mission to date. But its entire planet tally has been found via transits, or perturbations to the timing of those transits. Only a small fraction of all planets may be observed to transit their host star. Further, the transit probability falls off rapidly with increasing orbital period. The second most successful method for finding planets is the radial velocity method, which does not require transits but also has a detection rate that decreases with orbital period. In this talk, I present a new method of finding planets and other companions. The method utilises asteroseismic data from the Kepler Mission, namely the phases of stellar oscillations, to detect changes in the path length between Earth and the observed star due to motion in a binary system. I will show how the sensitivity of the method increases with orbital period, which allows the detection of planetary companions that have orbital periods on the order of 1000 d. The companions detected with this method include planets, brown dwarfs, main-sequence stars with masses between 0.1 and 2.5 M_{sun} , and possible compact objects such as neutron stars and black holes. Statistically robust distributions of eccentricity with orbital period are also discussed.